

## Executive Summary

In November 1999, Governor Dirk Kempthorne signed an Executive Order creating the Idaho Science and Technology Advisory Council. The Governor asked the Council, which is composed of business entrepreneurs, engineers, technology experts, and representatives of the state's academic institutions and major technology companies, to develop a state strategic plan for science and technology. Over the course of the past year, the Advisory Council completed a strategic planning process that included an assessment of Idaho's current competitive position and an analysis of how Idaho ranks in terms of those factors needed to support and grow a technology-based economy. These include a well-educated and highly skilled workforce, world-class research and development, sophisticated technology infrastructure and a thriving entrepreneurial climate. This report presents the Council's findings and proposes strategies and actions designed to foster the growth of new companies and industries and to help keep the state's traditional resource-based industries globally competitive.

### IDAHO'S COMPETITIVE POSITION

The Council documented that Idaho has significant technology assets. They include the following:

- A strong research and development base, including the presence of the Idaho Engineering and Environmental Laboratory (INEEL), upon which to build;
- A well-educated population;
- Research laboratories, universities and private companies that are generating a significant level of new knowledge; and
- A quality of life that is very attractive to technology companies and their workers.

In addition, Idaho has a rapidly growing base of technology companies with specializations in semiconductors and electronic computers and engineering services. High technology companies employ one-tenth of Idaho's workforce and account for close to one-sixth of the state's private sector payroll. These technology jobs contribute greatly to the economy as the state's high technology industries pay significantly higher wages than do other sectors of the economy. In 1998, Idaho's average high-technology wage was 78 percent above the average for the entire private sector.

Idaho is experiencing a high rate of new company formation and is home to a large number of new, rapidly growing firms. In 1998, Idaho ranked seventeenth among the fifty states in firm births and tenth in the nation in terms of the number of new rapidly growing firms, often referred to as "gazelles."

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#### Idaho Strengths

- Existing R&D and technology base
- Quality of the workforce
- Increasing base of technology-oriented companies
- Competitive business costs
- Growing number of start-up companies
- High quality university system
- Positive university/business relationships
- High quality public education system
- High quality of living
- Low cost of living
- Affordability of housing
- Recreational amenities

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### Factors That Could Inhibit Growth

- Lack of technically skilled workers, especially engineers
- Insufficient investment in education at K-12 and higher education levels
- Low level of industrially financed R&D at universities
- Poorly developed infrastructure for technology transfer and commercialization
- Lack of seed and early-stage capital
- No community of entrepreneurs
- State lacks image as a high technology center

While Idaho is well positioned to continue to grow its technology base, the Council also identified a number of factors that could inhibit economic growth if they are not addressed. While Idaho ranks highly in terms of R&D conducted by industry, only a small percentage of university R&D is industry sponsored. The council concluded that university-industry partnerships need to be strengthened in Idaho. A high quality public education system is a prerequisite for growing a technology-based economy, yet Idaho ranks 47th in terms of per capita spending on education among the fifty states.<sup>1</sup> Idaho's educational institutions are not producing a sufficient supply of engineers and other skilled technical workers to meet local industry needs. While Idaho is experiencing a high rate of new company formations, resources to support and nurture new start-up companies are limited. Very

little venture capital is being invested in Idaho companies. Lastly, although Idaho's businesses, universities and laboratories are generating new knowledge, Idaho's infrastructure for technology transfer and commercialization is underdeveloped.

Idaho is well positioned to become a leader in today's New Economy. But to do so will require investments by the State of Idaho, its citizens, and businesses.

## VISION

The Science and Technology Advisory Council has developed the following vision for Idaho:

*Idaho will have, and be recognized as having, a vibrant technology-based economy that provides employment opportunities and high wage jobs for Idaho citizens. Increased emphasis on the application and use of science and technology in Idaho will continue to spawn new companies and industries, while contributing to the global competitiveness of its traditional industries.*

## STRATEGIES AND ACTIONS

To achieve the above vision, the Council recommends that the following strategies be adopted and implemented:

- Build, attract and retain a highly skilled technical workforce.
- Invest in creating R&D excellence and promoting industry-university collaboration.
- Facilitate commercialization of technology developed in Idaho.
- Build an entrepreneurial culture that supports and nurtures new firm formation.
- Invest in the infrastructure needed to support a technology-based economy.
- Establish a national and international image for Idaho as a leading technology center.

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1. *State Profiles of Public Education*. Washington, DC: National Center for Education Studies.

## **STRATEGY 1: BUILD, ATTRACT AND RETAIN A HIGHLY SKILLED, TECHNICAL WORKFORCE.**

There is perhaps no more critical issue for technology companies than their need for well-educated, technical workers. In addition to providing a sufficient number of highly skilled scientists and engineers, it is important to ensure that students receive high quality math and science education at the K-12 level and that opportunities to continually upgrade and improve technical skills are available for existing workers. To address workforce development issues and build a stronger knowledge-based economy, Idaho should:

- *Provide adequate funding for education at all levels and improve science and math education at the K-12 level.* Options that should be considered include developing programs and initiatives at the middle school level designed to interest students and parents in math and science; instituting a differential pay scale that allows science and math teachers to be more highly compensated; using distance education technology to bring high quality math and science instruction to students in all parts of Idaho; and increasing math and science requirements for high school graduation over time.
- *Establish the Idaho Science and Engineering Education Initiative, a series of actions designed to double the number of science and engineering graduates over the next five years.* An Idaho Technology Scholarship should be created and support should be provided to the state's institutions of higher education to enable them to accommodate larger numbers of science and engineering students.
- *Create mechanisms to provide greater interaction between industry and academia in order to ensure that higher education curricula meet the needs of emerging industries.* Specifically, colleges and universities should involve industry in curriculum development and internship and cooperative programs should be encouraged.
- *Undertake a campaign to attract Idaho Natives to return to Idaho.* In the short-term Idaho companies will continue to recruit skilled technical workers to locate in Idaho. Idaho should consider a strategic campaign to attract Idaho natives working in technical fields to return to Idaho by making them aware of the employment opportunities available in the state.

## **STRATEGY 2: INVEST IN R&D AND PROMOTE UNIVERSITY-INDUSTRY COLLABORATION.**

A common feature of regions having a strong base of technology-intensive companies is the presence of major research institutions. While it is critical that Idaho invest in strengthening the state's university R&D capacity, it is also important to invest in areas that support the state's existing industrial base and emerging technology sectors. The following actions are proposed to strengthen the state's research base and promote greater industry-university collaboration.

- *Undertake a Research Excellence Initiative.* It is proposed that a Research Excellence Initiative be established to provide funding for faculty recruitment and infrastructure to develop research excellence in areas identified as key to Idaho's future economic growth.

- *Establish an R&D Voucher Tax Credit Program.* The Council recommends establishing an R&D Voucher Tax Credit Program to encourage higher education-industry partnerships. This program would provide up to a fifty percent “refundable” tax credit on the total funds provided by a private company to an Idaho higher education institution in order to undertake research and development.
- *Develop a strategy to attract federal R&D funding in areas of core competencies and emerging technology areas.* Idaho should use the Research Excellence Initiative to leverage federal funding for centers and institutes in key technology areas. Over the long-term, Idaho could consider creating a Strategic Technology Fund to provide matching funds for federal investments.

### **STRATEGY 3: FACILITATE COMMERCIALIZATION OF TECHNOLOGY DEVELOPED IN IDAHO.**

Idaho has a strong base of research and development activities on which to build its technology economy. But having strong research institutions doesn’t necessarily translate into new products and companies. Idaho’s research institutions, including INEEL, need to work closely with the business community and actively support commercialization. Actions that should be undertaken include:

- *Strengthen university and INEEL technology transfer operations.* Idaho’s research universities should articulate that collaboration with Idaho industry and contributions to regional economic development are part of the university’s mission and commit resources for technology transfer and commercialization activities. INEEL should continue to place a high priority on technology transfer and commercialization and establish policies that reward researchers for interacting with companies.
- *Review Board of Education intellectual property policy and practices.* It is proposed that the state’s IP policy be reviewed and changes made if necessary to provide flexibility in working out IP arrangements with private companies. In addition, a task force should be convened to develop a consistent model to guide university-industry interactions at Idaho’s universities.
- *Provide new product development assistance to manufacturers and other traditional industries.* Idaho has a strong and growing manufacturing base, much of which is concentrated in high technology sectors. The state should continue to support its Tech Help program, which helps small and medium size manufacturers to become more competitive. Tech Help should target services to emerging industry clusters and focus on product development as well as process improvement assistance.

### **STRATEGY 4: BUILD AN ENTREPRENEURIAL CULTURE THAT SUPPORTS AND NURTURES NEW FIRM FORMATION.**

States and regions that have been successful in technology-based economic development have generally had in place a thriving entrepreneurial culture. To build a climate supportive of entrepreneurship, Idaho should:

- *Develop and implement an entrepreneurship strategy.* The State of Idaho is one of ten states that have been selected to participate in an eighteen-month policy academy to help state officials develop strategies to support entrepreneurs and new start-up companies. The Idaho team that is participating in the policy academy should identify the needs of Idaho's technology entrepreneurs, assess the adequacy and availability of the state's existing entrepreneurial support system, and develop a comprehensive set of policies and programs to address any gaps identified
- *Initiate one or more angel investor networks.* Angel investments, investments made by high net worth individuals, are often the first source of external capital for a new start-up company, and so are extremely important to emerging technology firms. The Idaho Department of Commerce should work with the Department of Finance's Securities Bureau to develop policies that help Idaho businesses access angel investments while at the same time protecting the public interest. The Idaho Science and Technology Corporation proposed in the implementation section of this report should be tasked to develop and facilitate angel investor networks in Idaho.
- *Increase the availability of venture capital by offering personal tax credits to encourage individuals to invest in Idaho-based venture capital companies and/or emerging technology companies.* The council recommends that Idaho offer tax credits as a means of increasing the availability of early-stage seed and venture capital in Idaho. This tax incentive, available to Idaho's individual investors as a personal income tax credit, would benefit early-stage technology companies who are seeking seed funding.
- *Utilize state pension funds to encourage venture capital investment in Idaho.* To increase the availability of venture capital in Idaho, the Council recommends that a small proportion of the State's pension funds be invested in venture capital. Two approaches should be considered. First, the pension funds could invest a small percentage of total assets in venture capital. Second, the pension funds might create an intermediary vehicle, a privately-managed trust, or a fund of funds that co-invests with other profit-motivated investors in diversified, professional pools of venture capital.

## **STRATEGY 5: INVEST IN THE INFRASTRUCTURE NEEDED TO SUPPORT A TECHNOLOGY-BASED ECONOMY.**

To compete for technology-based growth, a state must provide the infrastructure demanded by technology companies. This means high quality schools, excellent transportation access, good municipal services, fully equipped "smart buildings," office space in attractive settings, "smart highways," and state-of-the-art telecommunications services. The infrastructure areas identified as being most critical to Idaho's continued economic growth are telecommunications and transportation. Idaho should:

- *Implement the telecommunications recommendations of the Rural Development Task Force.* The Council recognizes the importance of providing high speed, broadband connectivity to both businesses and citizens in all areas of Idaho and endorses the Rural Development Task Force's recommendation to "explore options and implement actions to promote broadband telecommunication to rural areas."

- *Investigate options for creating an Idaho Educational Intranet.* The State of Idaho has actively promoted the use of technology in its schools over the last decade. The Council recommends that the State Board of Education explore the possibility of creating a state-wide network that would link all of the state's educational institutions, community facilities, and state and local governments.
- *Pursue transportation improvements that will allow easier and more cost-effective travel between the state's major population centers.* There is currently no direct air service from Moscow to Boise or Moscow to Idaho Falls and Pocatello. As the University of Idaho builds relationships with businesses and other research institutions throughout Idaho, including ISU, BSU, and INEEL, demand for air service within Idaho will increase. State government should seek to engage air carriers to determine ways to meet the demand for air service from Moscow to other parts of Idaho. The Department of Transportation should be encouraged to accelerate improvements to highways linking Moscow and Boise. Efforts also should be made to encourage cost competitive air service from all areas of Idaho.

## **STRATEGY 6: ESTABLISH A NATIONAL AND INTERNATIONAL IMAGE FOR IDAHO AS A LEADING TECHNOLOGY CENTER**

In interviews with business, education, and community leaders, a large number of people indicated that they felt Idaho needed to change its image. The majority of those interviewed suggested that the state is not thought of as a center of technology and technology businesses. The following actions should be undertaken to improve Idaho's image as a high technology center:

- *Existing Idaho technology companies should take a leadership role in promoting Idaho as a high technology center.* A statewide technology council should be created to provide private sector leadership and to assist state government in implementing this strategy.
- *Idaho should undertake an educational and marketing campaign to increase Idahoans' knowledge and understanding of science and technology, the role it plays in their lives, and the opportunities it provides them.* Specific activities could include public service announcements, sponsoring special documentaries, highlighting the successes of entrepreneurs, companies, and university partnerships.
- *The state should market Idaho as a prime location for technology-based companies.* A marketing strategy should be developed to increase understanding of Idaho's high-technology capabilities. The strategy should emphasize the state's quality of life, focusing on those factors that appeal to high technology firms and workers, including presence of a technically skilled workforce, quality education, and recreational opportunities.

## IMPLEMENTATION

If the vision laid out in this strategy is achieved, Idaho will have an economy that provides high-skilled career opportunities for Idaho citizens, an enhanced quality of life, and a high standard of living. Idaho will be a leader in selected areas of science and technology critical to sustainable development and economic competitiveness.

Realizing the vision of a vibrant technology-based economy will require:

- Committed leadership;
- Collaborative partnerships between business, government, and academia;
- Investment of financial resources; and
- Commitment to measuring performance.

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### Priority Actions

- Create the Idaho Science and Technology Corporation
- Develop a Science and Engineering Education Initiative
- Establish a Research Excellence Initiative
- Initiate a proposal for a Venture Capital Tax Credit

## IDAHO SCIENCE AND TECHNOLOGY CORPORATION

For this ambitious effort to succeed, one entity must be designated and empowered to be responsible for implementing the strategy. *It is proposed that a private nonprofit entity, governed by a public-private board of directors, be created to oversee implementation of Idaho's science and technology strategic plan and to administer programs created as a result of adopting the strategy.* While state government should provide initial funding for the corporation, over time the corporation should seek to develop a base of private and other public funding.

This new corporation initially should be tasked with designing an Idaho Technology Scholarship Program, establishing a process to identify key technology areas for the proposed Research Excellence Initiative, and developing a proposal for a venture capital tax credit program. The corporation could also facilitate networking among technology entrepreneurs and CEO's of start-up companies and the establishment of an angel investor network. Lastly, the corporation should be given responsibility for monitoring progress taken in implementing each action identified in this strategy and tracking progress in achieving measurable objectives.

## CONCLUSION

Idaho is well positioned to build on its research base, continue to grow its technology economy, and improve the competitive position of its agricultural, fisheries, and forestry industries through the application of science and technology. The state's semiconductor and microelectronics and physical research and engineering services industries provide strong high value anchors on which to build. The state's high quality of life and productive workforce make it an attractive location for technology companies and workers.

Capitalizing on these opportunities, however, will require making the investments needed to build a world-class research base and an outstanding education system. Implementing the strategies and actions proposed in this report will propel Idaho into a leadership position in the knowledge-based economy and help to ensure a high standard of living and excellent quality of life for all Idaho citizens.